

Translation

PATENT COOPERATION TREATY

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INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference S6048 SMB/MR	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/FR2003/000053	International filing date (day/month/year) 09 janvier 2003 (09.01.2003)	Priority date (day/month/year) 20 septembre 2002 (20.09.2002)
International Patent Classification (IPC) or national classification and IPC C21D 1/613		
Applicant L'AIR LIQUIDE, SOCIETE ANONYME A DIRECTOIRE ET CONSEIL DE SURVEILLANCE POUR L'ETUDE ET L'EXPLOITATION DES PROCEDES GEORGES CLAUDE		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of <u>5</u> sheets, including this cover sheet. <input type="checkbox"/> This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT). These annexes consist of a total of _____ sheets.
3. This report contains indications relating to the following items: I <input checked="" type="checkbox"/> Basis of the report II <input type="checkbox"/> Priority III <input type="checkbox"/> Non-establishment of opinion with regard to novelty, inventive step and industrial applicability IV <input type="checkbox"/> Lack of unity of invention V <input checked="" type="checkbox"/> Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement VI <input type="checkbox"/> Certain documents cited VII <input type="checkbox"/> Certain defects in the international application VIII <input type="checkbox"/> Certain observations on the international application

Date of submission of the demand 11 juillet 2003 (11.07.2003)	Date of completion of this report 19 December 2003 (19.12.2003)
Name and mailing address of the IPEA/EP	Authorized officer
Facsimile No.	Telephone No.

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/FR2003/000053

I. Basis of the report

1. With regard to the elements of the international application:*

- ☒ the international application as originally filed
- ☒ the description:
 pages _____ 1-10 _____, as originally filed
 pages _____, filed with the demand
 pages _____, filed with the letter of _____
- ☒ the claims:
 pages _____ 1-14 _____, as originally filed
 pages _____, as amended (together with any statement under Article 19
 pages _____, filed with the demand
 pages _____, filed with the letter of _____
- ☒ the drawings:
 pages _____ 1/2-2/2 _____, as originally filed
 pages _____, filed with the demand
 pages _____, filed with the letter of _____
- ☐ the sequence listing part of the description:
 pages _____, as originally filed
 pages _____, filed with the demand
 pages _____, filed with the letter of _____

2. With regard to the language, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language _____ which is:

- ☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of the translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages _____
- ☐ the claims, Nos. _____
- ☐ the drawings, sheets/fig _____

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).**

* Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rule 70.16 and 70.17).

** Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.
PCT/FR 03/00053

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims		YES
	Claims	1-14	NO
Inventive step (IS)	Claims		YES
	Claims	1-14	NO
Industrial applicability (IA)	Claims	1-14	YES
	Claims		NO

2. Citations and explanations

1. Reference is made to the following documents:

D1: EP 1 050 592 A;
D2: EP 1 211 329 A;
D3: EP 0 869 189 A;
D4: EP 0 562 250 A;
D5: WO 02/44430 A.

2. **Claims 1 and 14**

2.1 D1 (claim 1) discloses a method for quenching workpieces, for example, after a carburising heat treatment operation. The quenching gas contains, for example, CO₂, CO, H₂O, NH₃, H₂S, methanol or mixtures thereof. Gases of this type absorb infrared radiation and are necessarily pressurised (see D1, column 1, lines 8-14 and 24-29). According to the preferred embodiments, the quenching gas contains 50% of H₂ and 50% of CO (D1, column 2, lines 19-23) or a CO₂-He mixture and 0.5 to 5% of CO (column 2, lines 52-54) or a mixture of nitrogen and 10% of CO (column 2, lines 55 and 56).

In claim 1 of the present application, the gases are

selected in such a way as to enhance heat transfer and the convective transfer coefficient. These features are defined in vague and relative terms and do not allow the claimed method to be differentiated clearly from the method disclosed in D1 of which the aim is to optimise the quenching conditions.

It follows that the subject matter of claim 1 is not novel (PCT Article 33(2)). This also applies to independent use claim 14.

- 2.2 For the same reasons, the subject matter of claims 1 and 14 is not novel over documents D2, D3, D4 or D5.

D2 discloses a method for quenching steel workpieces after a carburising heat treatment operation. The pressurised helium-based quenching gas contains a proportion of carburising gas. According to D2 (page 4, lines 44 and 45 and table 2), the quenching operation is carried out using a gas containing approximately 90% of helium, 3% of carbon dioxide, 2.1% of hydrogen, 1% of carbon monoxide and 3.8% of nitrogen.

According to D3, the addition of CO₂, H₂S or water vapour, in a proportion of up to 30%, to a pressurised quenching gas selected from He, H₂ or the mixtures thereof enhances the speed of quenching (claims 1, 2 and 4; column 2, lines 40-49).

D4 describes the advantageous effect of adding a gas such as H₂ to a quenching gas. The example on page 10, line 21, relates to a quenching gas containing 40% of N₂, 20% of CO and 40% of H₂.

In the pressurised quenching method known from D5, the cooling gas comes from the heat treatment atmosphere (claims 1 and 2). The composition of such a gas is, for example, 55% of N₂, 30% of H₂ and 15% of CO (page 6, second paragraph).

3. Dependent claims 3 to 13

The features in claims 2, 3 and 5 to 13 are known from at least one of the cited documents. The same is true of claim 4 because the expression "order of magnitude" is so vague that it is impossible to differentiate the claimed subject matter from the methods disclosed in the cited documents.

As far as claims 11 and 12 are concerned, see document D3 (claims 1 and 4).